17. (New) A porous insulating film according to claim 1 or 10, wherein the diamine component is selected from a phenylenediamine or a diaminodiphenylether.

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18. (New) A porous insulating film according to claim 1, wherein the pores in the porous structure are arranged in the film substantially parallel to the film surfaces.

19. (New) A porous insulating film according to claim 16, wherein the biphenyltetracarboxylic dianhydride is 3,3',4,4'-biphenyltetracarboxylic dianhydride.

20. (New) A porous insulating film according to claim 10, wherein the pores in the porous structure are arranged in the film substantially parallel to the film surfaces.

REMARKS

I. AMENDMENTS TO THE SPECIFICATION

The amendment to the specification at page 22, lines 18-35, finds support at pages 18, line 34 through page 19, line 2.

II. STATUS OF THE CLAIMS

Claim 5 has been canceled. Claims 1 and 10 have been amended. New claims 16-20 have been added. The amendment to claim 1 relating to "channels in a nonlinear fashion" finds support in the specification at page 1, lines 17-20. The amendment to claim 10 relating to "a mean pore size of 0.01 – 5 μm in at least one surface of the film" finds support at page 5, lines 13-15 and in Figure 7, while the "heat shrinkage of no greater than ±1 % at 105 °C" finds support at pages 18, line 34 through page 19, line 2. The amendments to claims 1 and 10 relating to "a polyimide obtained from the combination of at least one tetracarboxylic acid component and a diamine component" find support at page 8, lines 27-30 and in the Examples. Claim 16 finds support at page 10, lines 26-29. Claim 17 finds support at page 9, lines 29-30. Claims 18 and 20 find support in Figures 1-6. Claim 19 finds support at page 10, lines 2-5.

III. THE REJECTION UNDER 35 U.S.C. § 102(b)

Claims 1-7 and 10 have been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,450,198 to *Michaels* ("*Michaels*").

Cellulose acetate is specifically disclosed in the examples of *Michaels* as the material for the rate-controlling wall. However, *Michaels* does not disclose the components of the polyimide and the particulars of the production process that is employed to obtain a porous film possessing the characteristic features defined by Applicants' invention. Therefore, Applicants' invention is clearly distinguished from disclosures of *Michaels*.

In the Final Office Action of May 8, 2002 (Paper 10), the Examiner contends that *Michaels* anticipates Applicants' invention because "on lines 61-64 of Column 5, *Michaels* states 'Wall 11, in an inventive embodiment, also can be made from microporous polymer whose pores are filled with a water permeable material that regulates the passage of water into the device." In response, Applicants point out that even in the embodiment where the wall or housing (11) of the invention is composed solely of a microporous polyimide, the disclosed polyimide <u>must</u> be used in combination with a hydrophilic, swellable material (12) for the invention described as a dispensing device to function properly. Indeed, claim 1 of *Michaels* specifically recites to and is limited by such a combination. Further, the microporous polyimide is used in combination with a container (13) which stores some active agent. Applicants' claim 1, as amended, recites a porous insulating film <u>consisting essentially of</u> a highly heat resistant polyimide resin film. Therefore, *Michaels* cannot serve as a 35 U.S.C. §102(b) reference because the microporous polymer of *Michaels* incorporates limitations (*e.g.*, required components 12 and 13) that are not present in the claimed insulating film.

IV THE REJECTION UNDER 35 U.S.C. § 103(a)

Claims 1-7 and 10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable under U.S. Patent No. 5,510,395 to *Tomioka* ("*Tomioka*") in view of *Michaels*.

Claim 15 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Tomioka* in view of *Michaels* and further in view of U.S. Patent No. 4,824,743 to *Fujii* ("*Fujii*").

The microporous polymer of *Michaels* is present to "regulate the volume of fluid that enters the device." (Col. 5, lines 43-45). In addition, the microporous polymer must be used in conjunction with other components. *Michaels* does not teach or suggest using a microporous polyimide as an insulator and the desired insulating properties of high heat resistance and low dielectric constant are not discussed. Rather, as suggested by the title of *Michaels* ("Microporous Film **with Polymer in Pores** for Regulating the Passage of Fluid") (emphasis added) and its sole claim ("A microporous film comprising a microporous polymer, **housing in its micropores a solid polymer**...") (emphasis added), *Michaels* teaches the <u>combination</u> of a high heat resistant polymer resin with a low heat resistant swellable, hydrophilic polymer. Such a combination as required by *Michaels* would adversely affect the insulating properties sought in Applicants' claimed invention.

The Examiner declares that *Tomioka* discloses a porous polyimide that may be used as an insulating film. According to the Examiner, several physical parameters of the *Tomioka* polyimide (*e.g.*, pore size, porosity, thickness, dielectric constant, gas permeability, etc.) read on the Applicants' claimed insulating film. The Examiner acknowledges that *Tomioka* does not specifically disclose a porous structure having fine continuous pores that reach to both surfaces of the structure. However, the Examiner argues that *Michaels* does teach fine continuous pores and that it would have been obvious to a skilled artisan to combine the teachings of *Tomioka* and *Michaels*.

Upon review of *Tomioka*, we agree with the Examiner that *Tomioka* does not disclose fine continuous pores reaching to both surfaces of a polyimide film. However, we do not believe that it would have been obvious to combine the teachings of *Tomioka* and *Michaels*. As discussed above, the disclosure in *Michaels* of the presence of fine continuous pores that reach to both surfaces of the polymer is <u>strictly limited to the passage of fluids</u>. Changes in percent porosity and/or pore size directly affects the volume of fluid that flows through the polymer to reach the swellable hydrogel in contact

with the polymer. In contrast, *Tomioka* discloses that adjustments in the porosity of a polyimide film affect the dielectric constant of the film. (col. 10, lines 24-25). The graph on the front page of the *Tomioka* patent illustrates that an <u>inverse</u> relationship exists such that an increase in the amount of porosity results in a decrease in the value of the dielectric constant. *Tomioka* discloses that "a porous film having such a low dielectric constant can be advantageously used as an insulating film.... (col. 10, lines 27-29). There is no motivation for a skilled artisan to employ the finely continuous pores disclosed in *Michaels* to improve the dielectric properties of an insulating, porous polyimide film as described by Applicants. *Tomioka* teaches that it is the **amount** of porosity that affects dielectric constant and does not suggest or teach anything about the effect of pores that reach to both surfaces of the film. *Michaels* does not teach or suggest that the presence of fine continuous pores reaching to both sides of a polymer surface would have any relevance to the value of a dielectric constant or to any related property of an insulating film. Therefore, the Examiner fails to show that a skilled artisan would have reasonably expected success by modifying *Tomioka* view of *Michaels*.

Further, the porous films specifically described in the examples of *Tomioka* have elliptic pores of a width of not more than 3 μm and a length of not more than 7 μm. *Tomioka* does not disclose a porous film having continuous channels. This lack of disclosure is considered to be due to the differences in the production process of the porous film between *Tomioka* and Applicants' invention. In *Tomioka*, the precursor solution is heated and dried to form pores before imidation, while in Applicants' invention, the precursor solution is contacted with a pore-formed film to form pores before being heated, dried and imidated. Thus, the porous films have completely different performance profiles in that the porous film of *Tomioka* has hydrogen-separating properties while the porous film of Applicants' invention has liquid methanol permeability. The porous films of *Tomioka* and *Michaels* differ from each other in structure. Therefore it would not be obvious to a skilled artisan to see how the porous film described in *Michaels* can be obtained by using the material described in *Tomioka*.

Fujii describes a film having linear continuous channels reaching to both surfaces of a film. The feature of nonlinearity present in Applicants' described channels are

lacking in *Fujii*. In addition, *Fujii* does not describe a production process for making the porous film and does not remedy the deficiencies found in the combination of *Tomioka* and *Michaels*. Therefore, it would not be obvious to a skilled artisan how the porous film of Applicants' invention can be obtained by a combination of *Tomioka*, *Michaels* and *Fujii*.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTION PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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Dated: September 26, 2002

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Version With Markings To Show Changes Made

IN THE SPECIFICATION:

Paragraph beginning at page 22, lines 28-35:

A sample with graduated markings of a specified length was allowed to stand in an unbound condition for 8 hours in an oven set to 105°C [150°C], and after being removed its dimensions were measured. The heat shrinkage factor was determined by the equation given below. In the equation, L_1 represents the film dimensions after being removed from the oven, and L_0 represents the initial film dimensions.

IN THE CLAIMS:

1. (Amended) A porous insulating film consisting essentially of a highly heat resistant polyimide resin film having a fine porous structure wherein:

a) fine continuous channels reaching [pores reach] to both surfaces of the film[,] in a nonlinear fashion, have [with] a mean pore size of 0.01 – 5 μm in at least one surface [the center] of the film and [having] a porosity of 15 – 80%; and

b) the polyimide resin film consists essentially of a polyimide obtained from the combination of at least one tetracarboxylic acid component and a diamine component.

10. (Amended) A porous insulating film consisting essentially of a highly heat resistant polyimide resin film having a fine porous structure wherein: [according to claim 9, which has a porosity of 30 – 80%, a maximum pore size of no greater than 10 μm,]

a) fine continuous channels reaching to both surfaces of the film in a nonlinear fashion, have a mean pore size of 0.01 - 5 μm in at least one surface of the film; and

b) the polyimide resin film consists essentially of a polyimide obtained from the combination of at least one tetracarboxylic acid component and a diamine component and has

(i) a [film] thickness of 5 - 100 μm,

(ii) a resistance to passage of air of from 30 sec/100 cc to 2000 sec/100 cc,

(iii) a heat resistance temperature of at least 200°C [or above,] and

(iv) a heat shrinkage of greater than ±1% at 105°C.

16. (New) A porous insulating film according to claim 1 or 10, wherein the tetracarboxylic acid component is selected from a biphenyltetracarboxylic dianhydride, pyromellitic dianhydride and a benzophenonetetracarboxylic dianhydride.

17. (New) A porous insulating film according to claim 1 or 10, wherein the diamine component is selected from a phenylenediamine or a diaminodiphenylether.

18. (New) A porous insulating film according to claim 1, wherein the pores in the porous structure are arranged in the film substantially parallel to the film surfaces.

19. (New) A porous insulating film according to claim 16, wherein the biphenyltetracarboxylic dianhydride is 3,3',4,4'-biphenyltetracarboxylic dianhydride.

20. (New) A porous insulating film according to claim 10, wherein the pores in the porous structure are arranged in the film substantially parallel to the film surfaces.